

Spectrophotometric Detection of HNO by Trapping with Methemoglobin



*characteristic absorption
between 530 and 600 nm*

NO can also give a small response:



But glutathione quenching can confirm HNO:

$$k_{\text{HNO}} = 2 \times 10^6 \text{ M}^{-1} \text{ s}^{-1}$$

$$k_{\text{NO}} < 4 \times 10^2 \text{ M}^{-1} \text{ s}^{-1}$$

*glutathione will quench the characteristic Fe(II)NO absorption
between 530 and 600 nm if it was produced via reaction with
HNO, but will not if it was produced via reaction with NO*

Figure 1.

For Comparison -- Methemoglobin Assays with Angeli's Salt

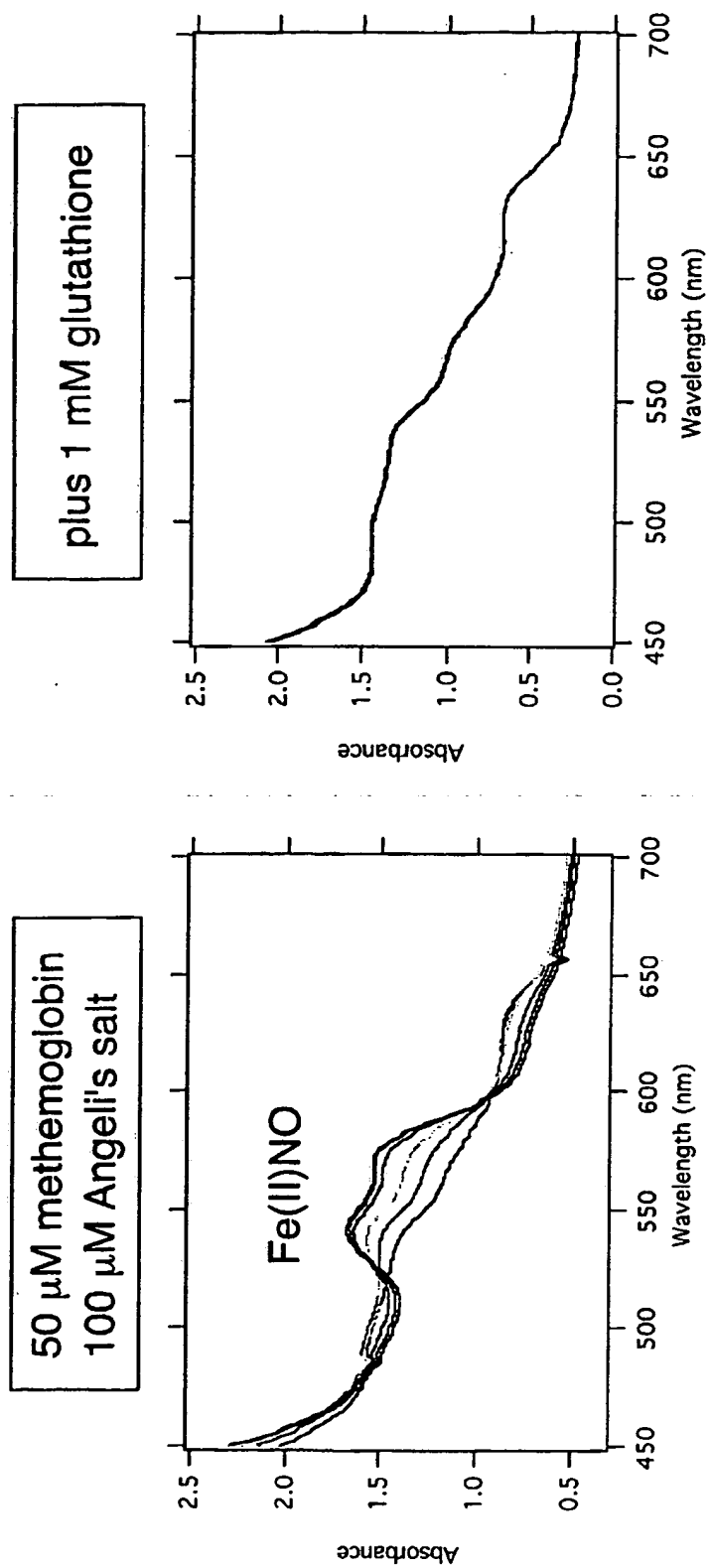
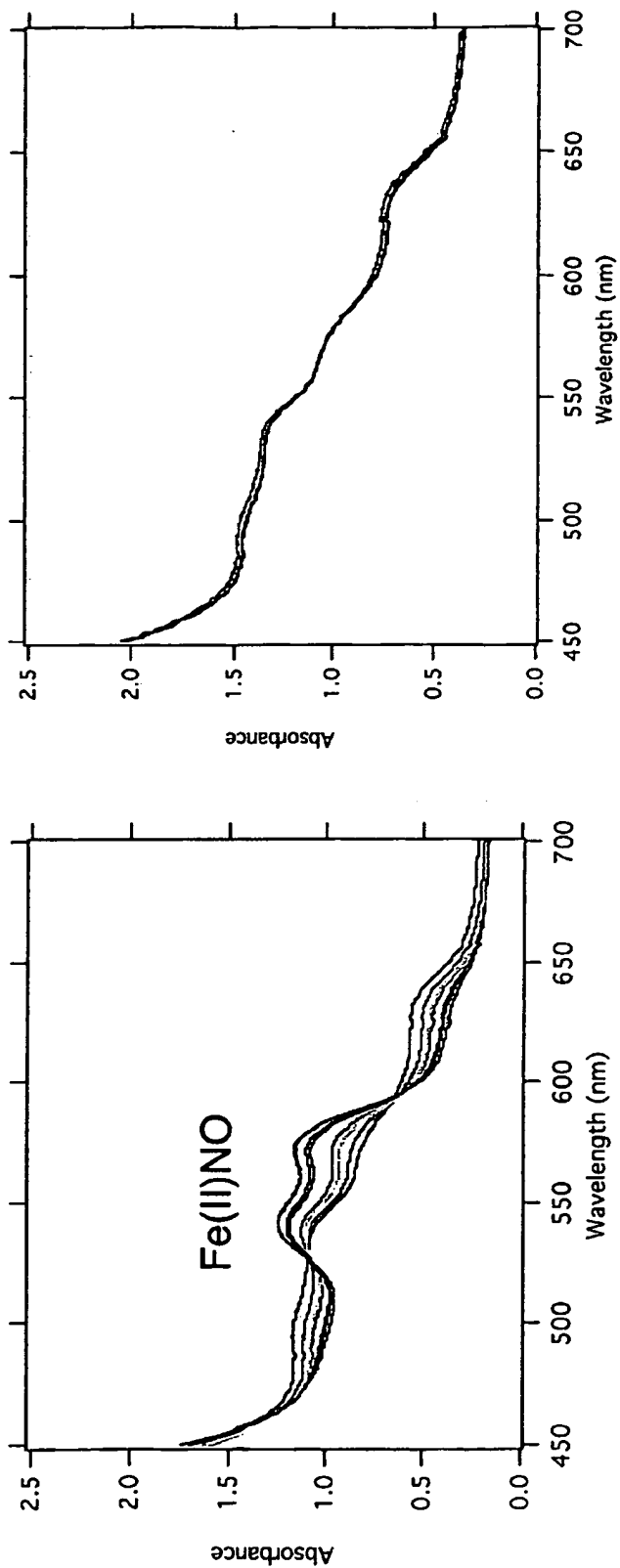


Figure 2.

Methemoglobin Assays with 2 (X=CN)

50 μ M methemoglobin
100 μ M 2 (X=CN)

plus 1 mM glutathione



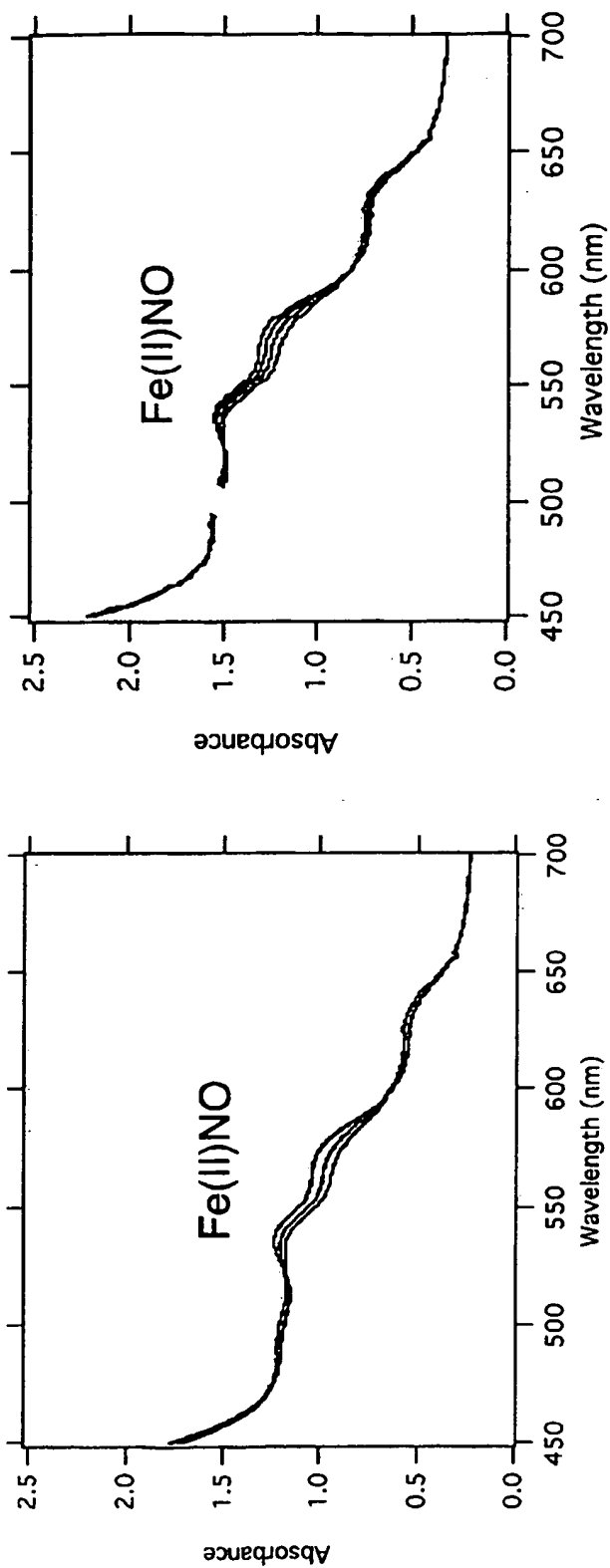
N₂O is observed by gas chromatography analysis as well

Figure 3.

For Comparison -- Methemoglobin Assays with 2 (X=H)

50 μ M methemoglobin
150 μ M 2 (X=H)

plus 1 mM glutathione

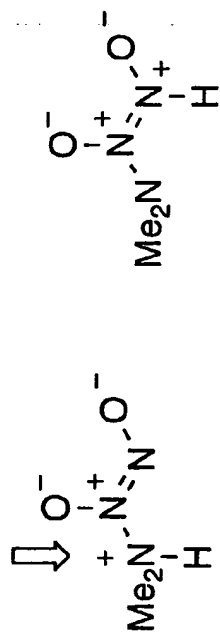


no N_2O is observed by gas chromatography analysis

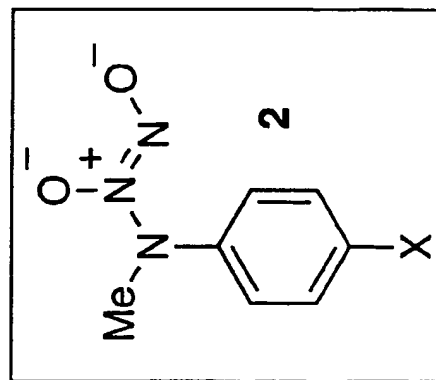
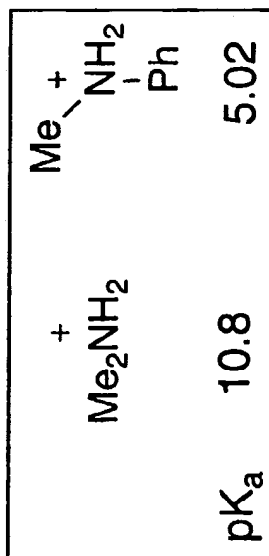
Figure 4.

The Effect of the pK_a of the Protonated Form of the Amine from which Compounds 2 are Made

Dutton, A. S.; Fukuto, J. M.; Houk, K. N.
Inorg. Chem. 2004, 43, 1039.



pK_a -2.1(dissociative) -8.6 \uparrow



$\text{X} = \text{H}$	NH_3	pK_a	NO
MeO		4.58	
Cl		5.29	NO
CN		3.98	HNO
NO_2		1.74	HNO
		1.02	

Figure 5.

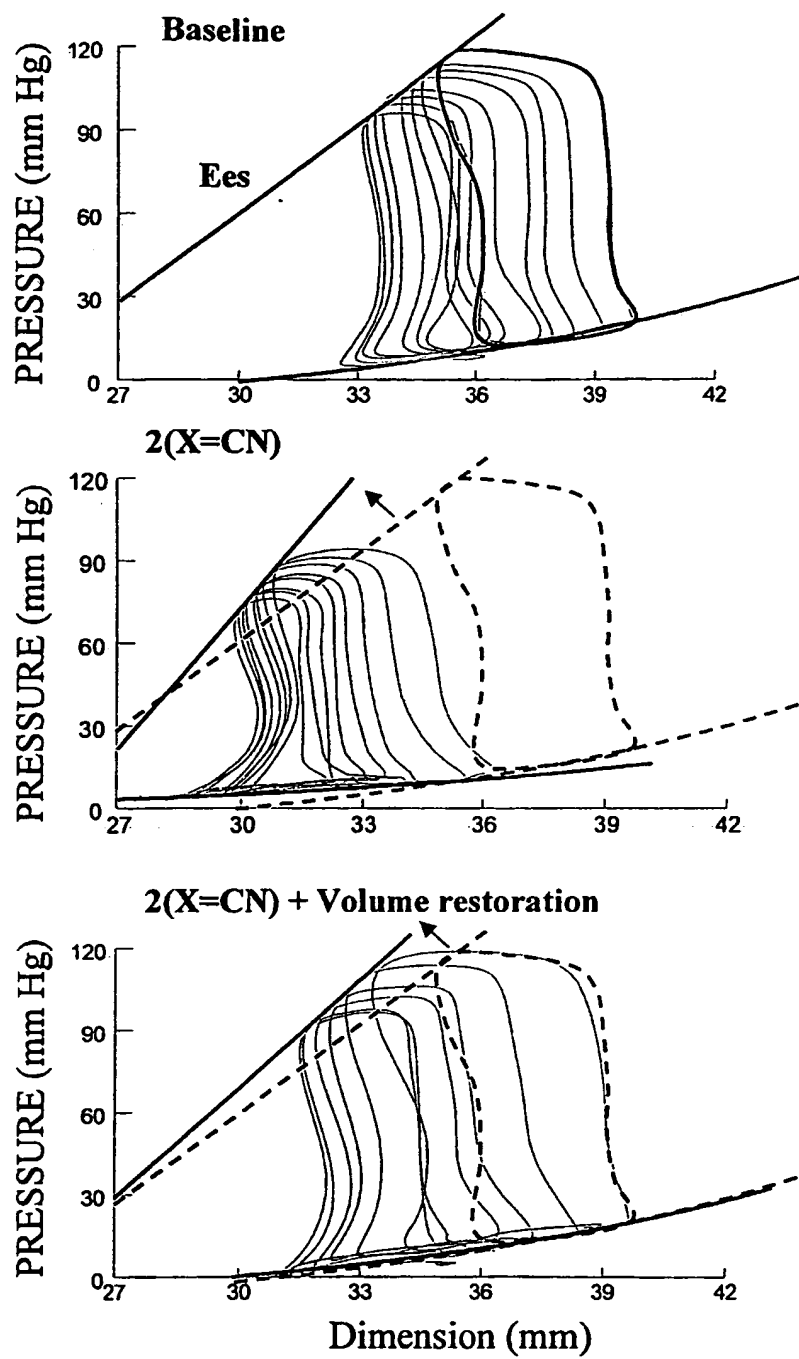


Figure 6.